Accordingly, since the subject matter of claim 1 has been incorporated into claim 2, claim 1 has been cancelled without prejudice and claims 4 and 5 have been made dependent on claim 2. Claim 2 has been further amended to add the limitations of "each said pixel having an opening defining an aperture ratio" and "the aperture ratio increasing as the capacitance of said auxiliary capacitor portions becomes smaller". Claim 9, which remains in independent form, has also been amended to add the same limitations. Support for the amendment to claims 2 and 9 is found in the specification on page 26, line 9, to page 27, line 21, which pertains to FIGS. 6A to 6C. In particular, page 26, line 25, to page 27, line 2, discloses the following with respect to FIG. 6A: "However, the area of the opening portion 18 becomes larger as the distance from the gate signal input portion 2 becomes larger. Therefore, the area of the opening 2 is much larger than that of the conventional liquid crystal display panel at the portion opposite to the gate signal input portion 2, and an aperture ratio is larger than that of the conventional liquid crystal display panel throughout the image display area."

The applicant, however, has not abandoned the subject matter of claim 1 and reserves the right to file a continuation application directed thereto.

Response to Arguments

In the Final Rejection, the Examiner has repeated the rejections of the first Office Action of January 18, 2002:

35 U.S.C. 103(a) Rejections: Claims 1 and 4-5

The Examiner has rejected claims 1, 4 and 5 under 35 U.S.C. § 103(a) as being unpatentable over Kuroha et al. (U.S. 6,028,650 – filed July 19, 1997 – issued February 22, 2000).

In response, although the applicant disagrees, the applicant has cancelled claim 1 without prejudice and incorporated the subject matter of claim 1 into claim 2. The dependency of claims 4 and 5 has been changed from claim 1 to claim 2.

35 U.S.C. 103(a) Rejections: Claims 2, 3, 6, 7 and 9-14

The Examiner has rejected claims 2, 3, 6, 7 and 9-13 as being unpatentable over Kuroha et al., as applied to claims 1, 4 and 5 above, and further in view of Taniguchi et al. (U.S. 6,334,689 B1 – filed February 25, 1999 – issued January 1, 2002).

In the First Office Action of January 18, 2002, the Examiner asserted that Kuroha, as modified, discloses the LCD device of the instant invention, which also includes a common counter electrode CE formed on an opposing substrate 8 and liquid crystal 9 is inserted into a gap between the passivation layer 7 and the common counter electrode CE as shown in FIGS. 4 and 5A, except for the backlight illuminating the LCD panel. However, the Examiner asserted that it would be obvious to one of ordinary skill in the art at the time the invention was made to dispose the lightsource of Taniguchi's backlight portion on the side of the

gate signal input portion of Kuroha's LCD panel such that luminance of light of the backlight portion becomes lower as the distance from the gate input portion becomes larger so as to obtain a high image luminance and a high image display quality.

With respect to claims 2, 3, 6, 7 and 9-13, the applicant argued that that neither Kuroha nor Taniguchi et al, taken alone or in combination, disclose, teach, or suggest luminance of backlight by the backlight portion becoming lower as the distance from the gate signal input portion becomes lower, as recited by claim 2, nor that an area of an aperture portion of a pixel becomes larger as the distance from the gate signal input portion becomes larger, as recited by claim 3. These same limitations are also present in independent claim 9. The applicant also argued that Taniguchi et al does not disclose the inclination of luminance of light from a backlight source, as recited by claim 12.

In the Final Office Action, the Examiner again refers to Taniguchi et al, Prior Art Figure 3, which discloses a light source 1, a light guide plate 2, and ink dots 8 which increase in area as the distance from the light source 1 increases, to compensate for the inclination of light from the backlight source. The Examiner asserts that the combination of Kuroha et al and Taniguchi et al will result in a better uniform luminance distribution, corresponding to the increase in area of the pixel aperture portion.

In response, the applicant has now cancelled claim 1 and rewritten claim 2 into independent form. The applicant has also amended claim 9.

The applicant respectfully maintains that neither Kuroha nor Taniguchi et al disclose, teach or suggest the limitations of claim 2, as amended, and claim 9, as amended, of "***auxiliary capacitor portions each additionally coupled with a pixel electrode of one of said pixel,*** *the width of said gate line becoming narrower and thereby capacitance of said auxiliary capacitor portions becoming smaller as the distance from said gate signal input portion becomes larger*" and "*the aperture ratio increasing as the capacitance of said auxiliary capacitor portions becomes smaller.*"

The applicant notes that Kuroha et al, column 3, lines 28-30, discloses the following:

> "Also, if the width of the gate lines GL0, GL1,...is increased, the *numerical aperture* is reduced."

In the present invention of claims 2 and 9, because of the auxiliary capacitor portions each additionally coupled with a pixel electrode of one of said pixel, even if the numerical aperture is reduced, the uniformity of the effective luminance within the display area can be maintained.

In particular, page 18, lines 1-13, disclose in part that the capacitance of the auxiliary capacitors each provided corresponding to a pixel electrode decreases by reducing the width of a gate signal line as the distance from the gate signal input portion increases. Also, luminance of the backlighting from the backlight portion

decreases as the distance from the gate signal input portion increases. Therefore, it is possible to effect uniformity of the feedthrough voltage components within an image display area and to suppress image persistence, stain and the like within the entire image display area. Also, the luminance of the displayed image increases and is made uniform. As a result, improvement of the quality of the image display becomes possible.

Furthermore, the applicant notes herein that by optimizing the design of the panel and backlight portion, it is possible to increase luminance, as shown in FIGS. 6A to 6C, as compared to the prior art illustrated in FIGS. 7A to 7C. The increase in luminance obtained by the present invention of claims 2 and 9, as amended, is greater than that obtained by the prior art, and results from the increase in the aperture ratio, as recited by claims 2 and 9, as amended.

Since neither Kuroha et al nor Taniguchi et al disclose, teach or suggest auxiliary capacitor portions each additionally coupled with a pixel electrode of one of said pixel, or an aperture ratio which increases as the capacitance of the auxiliary capacitor portions becomes smaller, as recited by claims 2 and 9, as amended, it is not possible to maintain the uniformity of the effective luminance within the display area by either the invention of Kuroha et al or Taniguchi et al or the combination of the two.

Therefore, claims 2- 7 and 9-13 patentably distinguish over Kuroha in view of Taniguchi et al. The applicant respectfully requests that the Examiner withdraw the rejection of claims 2-7 and 9-13.

The foregoing Amendment and Remarks establish the patentable nature of all of the claims remaining in the application, i.e., claims 2-7 and 9-13. Claim 1 has been cancelled without prejudice. Claims 8 and 14 were previously cancelled without prejudice. No new matter has been added, wherefore, early and favorable reconsideration and issuance of a Notice of Allowance are respectfully requested.

Respectfully submitted,

Anthony N. Fresco

Anthony N. Fresco
Registration No. 45,784

SCULLY, SCOTT, MURPHY & PRESSER
400 Garden City Plaza
Garden City, New York 11530
(516) 742-4343/ 4366 FAX

ANF:yd

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claim 1 has been cancelled without prejudice.

Claim 2 has been amended as follows:

2. (Amended) A liquid crystal display device [as set forth in claim 1, further comprising] having a liquid crystal display panel, said liquid crystal display panel comprising:

a plurality of pixels which are disposed in a matrix having rows and columns and each of which has at least a thin film transistor (TFT) and a pixel electrode, each said pixel having an opening defining an aperture ratio;

a plurality of gate signal lines which extend from a gate signal input portion disposed along a side of said liquid crystal display panel and each of which is coupled with said TFT's in a row of said matrix;

auxiliary capacitor portions each additionally coupled with a pixel electrode of one of said pixel, the width of said gate signal line becomes narrower and thereby capacitance of said auxiliary capacitor portions becomes smaller as the distance from said gate signal input portion becomes larger, and

a backlight portion for illuminating said liquid crystal display panel from the backside thereof, luminance of backlight by said backlight portion becomes lower as the distance from said gate signal input portion becomes larger, the aperture ratio increasing as the capacitance of said auxiliary capacitor portions becomes smaller.

Claim 4 has been amended as follows:

4. (Amended) A liquid crystal display device as set forth in claim [1] 2, wherein capacitance of each of said auxiliary capacitor portions is determined by an area of an opposing portion between a pixel electrode of a pixel and a gate signal line coupled with an adjacent pixel via an interlayer insulating film and a nitride film between said pixel electrode and said gate signal line.

Claim 5 has been amended as follows:

5. (Amended) A liquid crystal display device as set forth in claim [1] 2, wherein capacitance of each of said auxiliary capacitor portions is determined by an area of an opposing portion between a pixel electrode of a pixel and a gate signal line coupled with an adjacent pixel via an interlayer insulating film between said pixel electrode and said gate signal line.

Claim 9 has been amended as follows:

9. (Amended) A liquid crystal display device comprising:

(a) a liquid crystal display panel having:

a plurality of pixels which are disposed on a TFT substrate in a matrix having rows and columns and each of

which has at least a thin film transistor (TFT) and a pixel electrode, each said pixel having an opening defining an aperture ratio;

a plurality of gate signal lines which extend on said TFT substrate

from a gate signal input portion disposed along a side of said liquid crystal display panel and each of which is coupled

with said TFT's in a row of said matrix;

auxiliary capacitor portions each additionally coupled with a pixel electrode of one of said pixel, the width of said gate signal line becoming narrower and thereby capacitance of said auxiliary capacitor portions becoming smaller as the distance

from said gate signal input portion becomes larger; and an opposing substrate

which opposes to said TFT

substrate while keeping a small gap therebetween, said small gap being filled with liquid crystal; and

(b) a backlight portion for illuminating said liquid crystal display panel from the backside thereof, luminance of backlight

by said backlight portion becomes lower as the distance from said gate signal input portion becomes larger, the aperture ratio increasing as the capacitance of said auxiliary capacitor portions becomes smaller.